

en écrivant ce petit ouvrage, que nous considérons comme une *Introduction à l'étude de la Chimie organique*" (Preface).

How refreshing must it seem to teachers in this country to meet with an elementary work on chemistry containing no reference to the "Syllabus" of any Board of Examinations. R. M.

Penrose's Pictorial Annual, 1902-3. The Process Year-book. An Illustrated Review of the Graphic Arts. Edited by William Gamble. Pp. xvi + 136 and 56. (London: A. W. Penrose and Co., Ltd., 1902.)

THE present issue of this very handsome and interesting year-book forms the eighth volume of this useful publication. Year by year the progress made in process work is here recorded, and at each issue the high standard of excellence of this book is raised. The rapid strides made in three-colour work and its general application to technical and artistic subjects render the present volume of especial interest, and the editor has brought together numerous articles and reproductions which will give the reader, not only a good insight into the principles involved, but a general idea of the excellence of the finished pictures.

As in former volumes, the engraver, printer, publisher, &c., have all apparently vied with each other to produce the best work, and an examination of the book down to the most minute detail shows how completely each has succeeded in his task. Printed on "perfection quality art printing" paper, the type in the text, and the illustrations, appear at their best, and in each case useful details, such as description of the original process employed, name of printer, &c., are added. The illustrations are representative of the application of process work to all types of subjects, from blocks for catalogue illustrations, such as cut-glass objects, silver work, machinery, &c., to others as reproductions of oil paintings, landscapes, portraits, birds' eggs, &c.

Although little has yet been said about the text, the articles on the various topics will be found full of useful and interesting facts and experiences. The book will be found a valuable addition, not only to the library of the amateur or professional photographer or process worker, but to those who wish to choose between different processes as judged by the finished examples. As a simple picture book, it should have many admirers.

The Zoological Record for 1901. Edited by D. Sharp. (London: Zoological Society, 1902.)

YEAR by year, this invaluable publication increases in bulk, the present volume being considerably thicker than the one for 1900, as the latter was larger than its predecessor. The task of the editor and his staff is indeed a prodigious one, and the marvel is how it is completed year by year within the allotted time. That shortcomings must occur here and there is, as the editor admits, inevitable, but all concerned are to be congratulated that they are so few and far between. At the conclusion of his preface, Dr. Sharp suggests that before many years elapse the "Zoological Record" may come to an end, owing to its place being filled by the "International Catalogue of Scientific Literature." Unless, however, the latter undertaking progresses at a more rapid pace than at present seems to be the case, naturalists will sadly miss the regular appearance of the well-known russet volume shortly before Christmas, and it would be a thousand pities if the publication were discontinued before it became absolutely superfluous. Except a certain lack of uniformity between the different sections, to which we have called attention on a previous occasion, the volume before us is so carefully edited as to call for nothing in the way of criticism.

NO. 1734, VOL. 67]

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Biology in Universities.

IN connection with an editorial article on university development at the beginning of your issue of January 1, where you quote a pamphlet of mine called "A Survey of the Sciences," drawn up for the information of Governors of the University of Birmingham, I have received a contribution to the subject from Prof. Herdman, emphasising the separate inclusion of Biology in addition to the specific sciences of Zoology and Botany, and especially emphasising its vital importance in the scientific study of Medicine.

I would ask you, therefore, to print it as the opinion of a highly competent specialist. OLIVER LODGE.

IN NATURE of January 1, p. 193, right-hand column, middle, between ARCHÆOLOGY and BOTANY, I should like to have seen:—

BIOLOGY:—The fundamental science of medicine—which may, in fact, be regarded as applied experimental biology.

It is, therefore, an essential part of the preliminary training of every medical student.

It is the central, or basal, area of the natural sciences, containing, as it does, the facts and principles which are common to, and undergo application and further elaboration in, the sciences zoology, botany, anatomy, physiology, pathology, bacteriology, anthropology, psychology and palæontology.

It is (or should be), moreover, a subject of general culture, with many interesting applications to ordinary everyday life; and is of primary importance in philosophy both on account of its historic connection with the work of Darwin, Herbert Spencer and Huxley—biologico-philosophic work the influence of which, not only upon science, but also upon many other departments of thought it is difficult to estimate—and also because of more recent developments in connection with heredity, reproduction, &c.

All this on the pure science or educational side. In its practical applications, biology has an enormous field before it in the future in connection with arts and industries, our food supplies, fisheries, drainage and the metabolism of the ocean—matters affecting the health of man and the prosperity of the country.

Some of these points were referred to under zoology or botany, but there is so much ground common to these two sciences, and they are so interwoven both in matters of theory and in practical applications, that it is desirable to recognise these relations under the heading biology.

W. A. HERDMAN.

University College, Liverpool, January 2.

Genius and the Struggle for Existence.

IF the struggle for existence and survival of the fittest mean anything at all, they surely mean that any quality which is useful to the individual, or race, will be preserved and increased. Sir Oliver Lodge, however, in his "Survey of the Sciences," as reported in NATURE, January 1, says:—

"The struggle for existence, though doubtless a stimulating training for the harder and sturdier virtues, is not the right atmosphere for the delicate plant called genius."

But if genius is not evolved in the struggle for existence, then it is not an advantage. In the usual phraseology of natural selection, it is considered enough to say, "Such and such a quality, or organ, is useful, therefore it will be evolved in the struggle for existence."

If, then, Sir Oliver Lodge is right, either (1) genius is not useful, or (2) useful qualities are not—necessarily—evolved in the struggle for existence.

And if genius is—which I take leave to doubt—the tender greenhouse plant represented by Sir Oliver Lodge, is it worth while trying to preserve it in this—more than—bracing environment we call life? So far as I can gather from the figures given, the education of one whose discoveries will be of

"incalculable value" involves the education on similar lines of 9999 who will not be of any special value.

13 Vicarage Drive, Eastbourne. G. W. BULMAN.

YOUR correspondent, like many other people, regards the struggle for existence, not only as a fact, but as an ideal; not only as a necessary mode of effecting improvements in low-grade organisms, but as a method which should indefinitely continue in unchecked and unaided action, in spite of the arrival on the scene of a comprehending and guiding intelligence, such as may be competent to replace it by methods more direct and rapid; for instance, the methods of artificial selection and protection of the weak, which we have learnt how to begin to practice.

He also presses his admiration for the struggle-and-survival method so far as to suppose that no properties and powers can be useful which are not fostered by it.

To me it seems that struggle and competition are more akin to those forces of nature which the human race does wisely to train and hold in check, as a maritime country might protect its coasts from the ravages of the sea, instead of sitting idle and assuming that nature alone, without the guiding hand of man, is perfect and unimprovable. Surely it is a mistake to suppose that the fostering care which after long effort has been now manifestly introduced into the scheme is useless and inoperative and subordinate to the forces which preceded it.

OLIVER LODGE.

A Pot of Basil.

MR. A. E. SHIPLEY'S interesting article (p. 205) on *Ocimum viride* and its influence on mosquitoes recalled some observations that I made upon the papaw tree (*Carica papaya*) in China. My house, on the bank of the river at Whampoa, near Canton, was singularly free from mosquitoes, though the other houses on the same island were more or less infested with them. A line of papaw-trees stretched between my house and the river. I frequently watched these trees, yet I never saw a single insect alight on them, though flies and other insects settled in numbers upon the bamboos and banana-plants not far away. In fact, the papaw-trees seemed to keep insects at a distance and to act as a rampart guarding the house from mosquitoes. The probability of this suggestion was considerably strengthened by the increase in the number of mosquitoes entering the house after a typhoon had blown down two papaw-trees and thus made a gap in the row, and by the still further increase when a second typhoon felled another of the trees. I have questioned a number of persons living in the tropics, and one of them stated that he was familiar with the fact that papaw-trees repelled mosquitoes.

That the papaw-tree possesses some curious property—in addition to the notorious proteolytic action of its juice—is suggested by the widespread practice of hanging meat in its shade to render the meat tender. The custom is frequently regarded as a senseless one, but its wide distribution causes one to ask, Is it not possible that the papaw-tree should exhale a gaseous product which either repels meat-destroying insects or exerts an antiseptic action on putrefactive bacteria, or, finally, is a volatile ferment? The peculiar relation in regard to temperature displayed by the proteolytic ferment of the papaw juice renders the last possibility less improbable than at first impression.

PERCY GROOM.

The Mismanagement of London University Library.

Is it impossible for the powers that be at London University to abolish the scandalous regulations concerning the library, and to render this library a means of culture instead of an almost unusable and unused collection of books? A university library ought to be so managed that anyone wishing to bequeath books could put them to no better use than by leaving them to the university; but, as things are, it would scarcely be possible to more effectually waste books than by giving them to London University. In the first place—contrary to the practice of the learned societies and the subscription-libraries—no graduate is allowed to have books sent to him by post, which regulation at once renders the library utterly useless to the great majority of graduates. Secondly, an absolutely insane rule requires the return of all books by December 31 of each year, even though they may have been borrowed at Christmas and are required for study during the vacation! and although I interpret this

rule as applying only to non-members of Convocation, a contrary interpretation has prevented me from obtaining books a fortnight ago. Thirdly, although the University has now been located in its new home for two years, a personal demand for books is met by the reply that, as "the books of the library have not yet been arranged, and the whole library is in a very disorganised state," the books either cannot be found at all or only after several days' delay! The history of a recent attempt to obtain books from this library would move the careless to laughter and the studious to anger; but I dare not trespass further on your space.

F. H. PERRY-COSTE.
Polperro, R.S.O., Cornwall, January 8.

Recent Earthquakes in Guatemala.

A FEW weeks ago, I returned from a journey of several months' duration through the western part of the republic of Guatemala, where I investigated, at the request of the Government, the causes and effects of the recent earthquakes. The principal results are the following:—

The first severe earthquake was reported to have occurred on January 16, 1902, at the south-west of Mexico, destroying Chimalzingo, the capital of the State of Guerrero.

On January 18, 5.20 p.m., a strong shock occurred on the Pacific side of Mexico and Guatemala, shaking down in the latter country the village of San Francisco Zapotitlan (near Mazatenango), and destroying buildings and masonry work in several large plantations near this village and farther west in a district south-east of the town of San Marcos. The shock came from the S.S.W., and was reported from the whole Pacific coast of Guatemala and Soconusco, but I could not get information how far inland it was perceived.

From that time on, a great many local shocks were noted in the western part of Guatemala, especially in a district called Costa Cuca.

At 8.25 p.m., April 18, the most severe earthquake occurred, being felt from Nicaragua to the city of Mexico, over all Chiapas, the whole republic of Guatemala, British Honduras and a great part of Spanish Honduras.

In my sketch (NATURE, June 12, 1902), the region in which most destructive effects occurred must be extended more to the west, taking in north-eastern Soconusco.

In Guatemala, the towns that suffered most were Quezaltenango, San Juan Ostuncalco, San Pedro Sacatepequez, San Marcos and the Port of Ocosingo. Great was also the damage done in the numerous coffee plantations. Enormous landslips dammed up rivers (Rio Naranjo and Rio Ixtacapa) and destroyed hundreds of thousands of coffee-trees. The total loss of human life numbered 330 to 335, of which 129 were killed in Quezaltenango and forty-nine in San Pedro Sacatepequez.

The earthquake lasted more than fifty seconds and also came from the S.S.W. This was clearly shown by the effects of the shock in the coast towns and in the coffee region; in Quezaltenango and San Marcos, there have been movements in many directions, but the initial one was also from S.S.W.

After April 18, a great number of smaller shocks of short duration and generally very restricted extension were observed, most of them again in the Costa Cuca and neighbouring districts, and on September 23 another larger earthquake shook the whole country again, but did little damage (in Quezaltenango a child was killed by a falling wall). I was then in Guatemala City, where the shock lasted sixty-five seconds. The movement was again from S.S.W. Reports about it came from the Peten, Belize, Salvador and Chiapas.

The epicentrum of the great earthquakes of January 18, April 18 and September 23 must be situated out in the Pacific Ocean; the cable which connects San José de Guatemala with the Mexican port Salina Cruz was broken during October.

The local shocks (of which I noted a great many) between the large ones came from different directions. Underground noises were frequent.

There had been wild reports about threatening eruptions or the Fajumulco Volcano (4210 m.), the highest in Central America. I ascended it in June and went around it at its base, but the volcano was quiet. Great land and rock slides had altered its slopes a little, especially to the south and around the crater. The hot springs at the town of Fajumulco were nearly in the same condition as when I had seen them in 1885.

The people of the district were also much afraid of the volcano of Santa Maria. This volcano, 3768 m. high, is in its upper